J. J. TAGUE.

VALVE.

APPLICATION FILED DEC. 9, 1914.

1,206,485.

Patented Nov. 28, 1916.

3 SHEETS—SHEET 1.

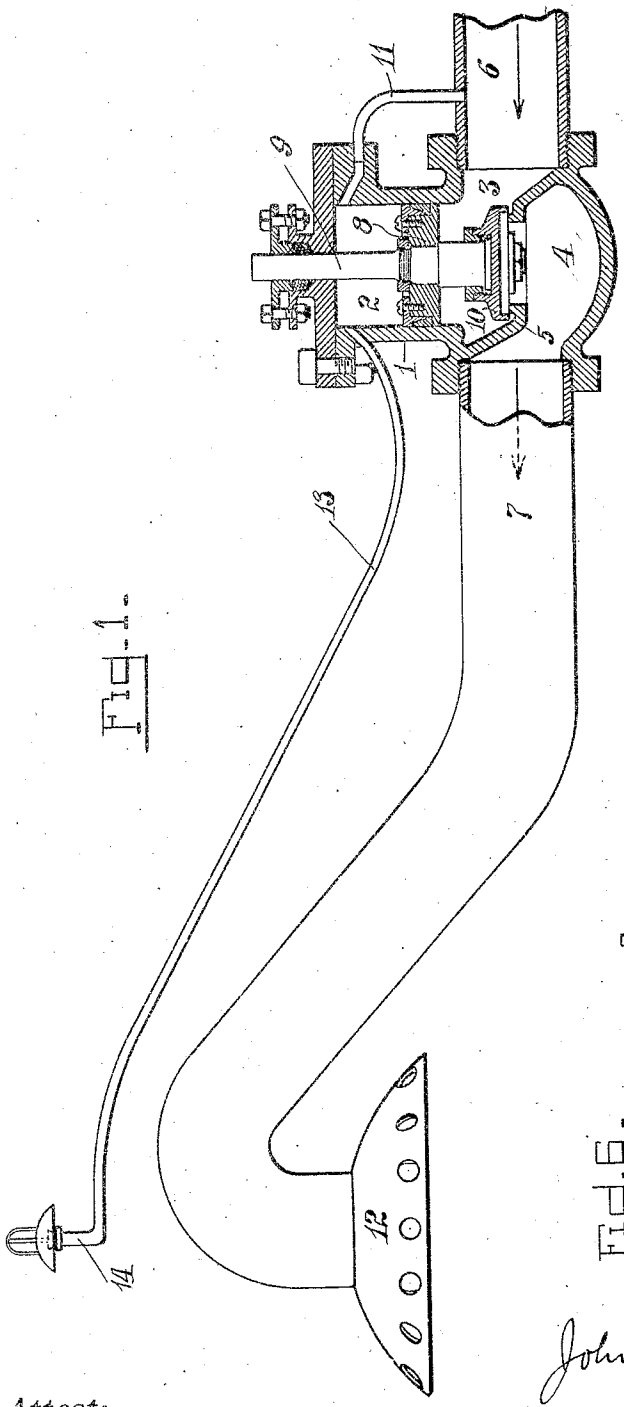


Fig. 1.

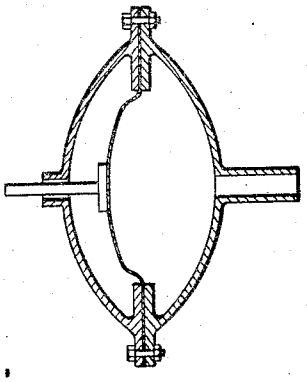


Fig. 6.

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Atty

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Fig. 2.

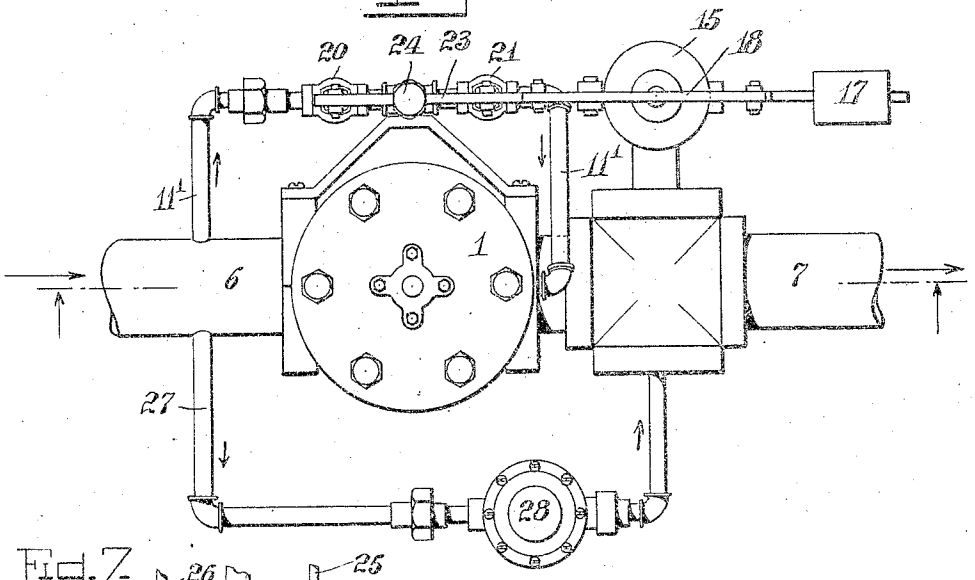


Fig. 7.

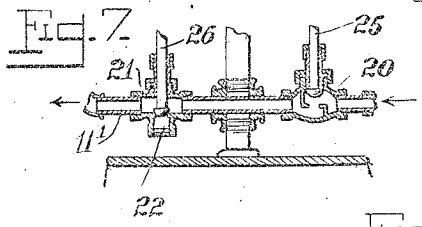
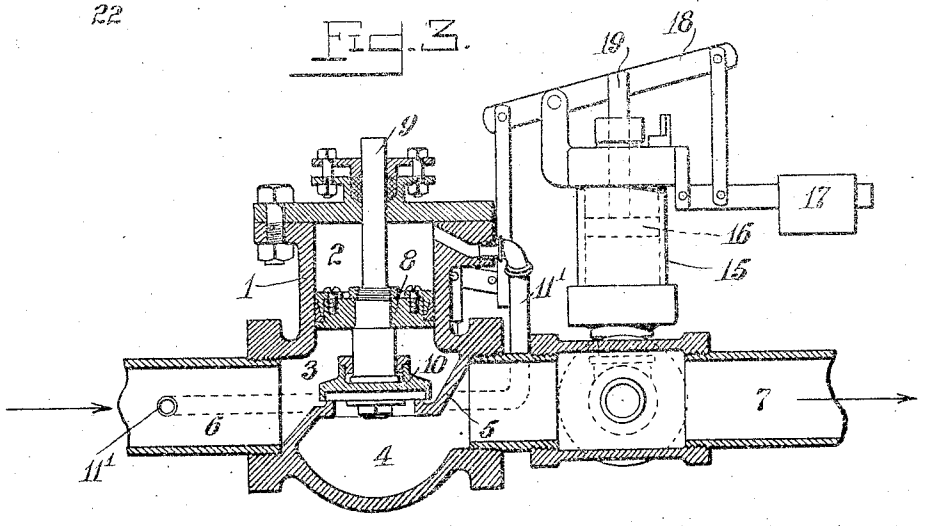


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

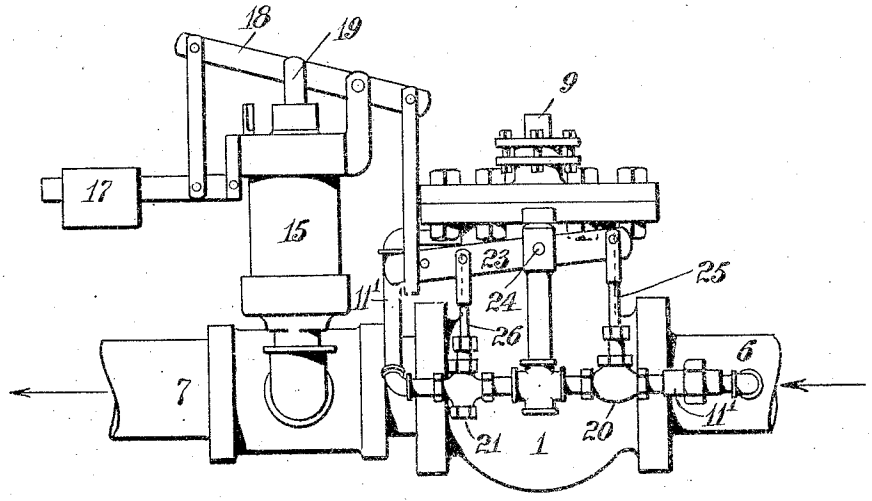
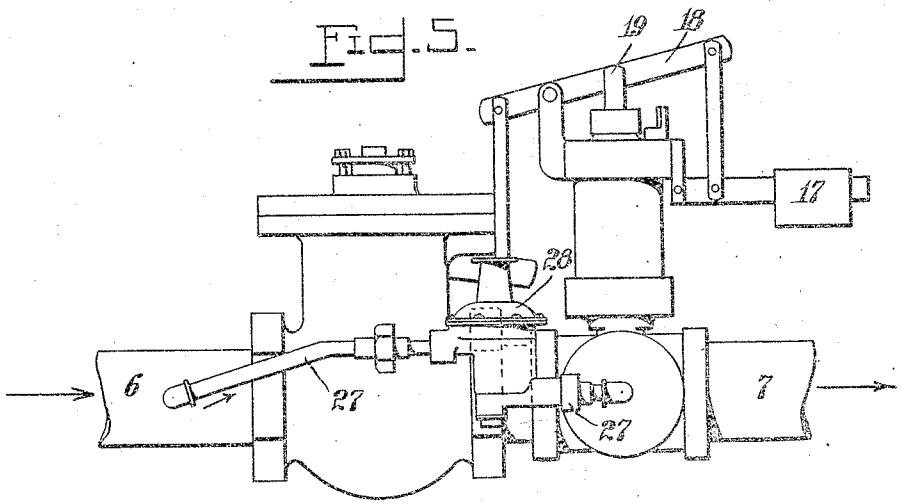


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN J. TAGUE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO HENRY BOLLMAN, OF BROOKLYN, NEW YORK.

VALVE.

1,206,485. Specification of Letters Patent. Patented Nov. 28, 1916.

Application filed December 9, 1914. Serial No. 876,300.

To all whom it may concern:

Be it known that I, JOHN J. TAGUE, a citizen of the United States, residing in the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My invention relates to control valves intended primarily for use in connection with fire extinguisher sprinkler systems of either the wet, dry, or foam type and my objects are the production of a valve which will have the full pressure on one side to hold it firmly in its seat, together with positive and simple means for operating it and which can be quickly and easily reset.

In the drawing Figure 1 is a view of the valve and control means used in connection with one or more outlets such as are used in inclosed spaces like powder magazines and oil tanks, where a quick flow of a large body of liquid, or gas is required; Fig. 2, a top view of the valve and control system used in connection with one or more sprinkler heads; Fig. 3, a view partly in section through the valve; Fig. 4, a back view of the valve and control mechanism; Fig. 5, a like view of the front; Fig. 6, a sectional view of a diaphragm control for use with air, gas or water, and Fig. 7, a detail section of the control valves. The arrows indicate the direction of flow in all cases.

The valve proper comprises a housing 1 having an upper cylinder 2 and lower chambers 3 and 4 separated by a valve seat 5. An inlet pipe 6 communicates with the chamber 3 and an outlet pipe 7 with the chamber 4. A piston 8 reciprocates in the cylinder 2 and an extension on the piston 9 carries the valve disk 10, of less area than the piston. A pressure equalizing connection 11 leads from the upper side of the piston 8 to the inlet pipe 6. When the pressure is applied to the inlet pipe 6 and the valve disk 10 is seated the entire force will be exerted on the upper side of the valve disk to hold it solidly on its seat. The pressure being balanced on both sides of the piston 8 enables the valve to be opened and closed easily when necessary. The piston 8 having a long sweep affords a large lift and full opening of the valve disk 10.

To open the valve disk 10 means are provided for venting the water on top of the piston 8 so that the pressure on the lower side will cause the piston to rise, carrying the valve disk 10 off its seat, the rapidity of the lift depending on the relative areas of the valve disk and piston, and the rate of venting.

Where one or more outlets 12 for inclosed spaces like a powder magazine or oil tank are employed, a vent pipe 13 is provided with one or more pilot heads 14 suitably located and provided with the customary fusible strut or link. The equalizing pipe 11 in this case being smaller in cross-section than the vent pipe 13 so the upper portion of the cylinder 2 will freely empty. So long as all the heads 14 are tight and valve disk 10 is seated the full pressure in the inlet pipe 6 will be exerted on the top of the valve disk to hold it to its seat and no water will pass to head 12.

When the temperature rises high enough to melt the strut on a pilot head 14 the fluid in pipe 13 and the upper side of piston 8 will be forced out by the pressure on the under side of the piston 8 and it will rise carrying the valve disk 10 with it allowing the full flow to pass immediately to an outlet 12.

Where one or more sprinkler heads is employed the venting mechanism employed is shown in Figs. 2, 3, 4, 5 and 7. In this case a cylinder 15 is in communication with the outlet pipe 7. A piston therein is normally held down by the weight 17 acting on the lever 18 which bears on the piston rod 19. The equalizing pipe 11 has two valves 20 and 21. The outlet 22 of the valve 21 is normally closed and valve 20 is normally open as shown in Fig. 7. The lever 18 is connected with the lever 23 fulcrumed at 24, the ends of which carry the valve stems 25 and 26.

Assuming the pressure on the inlet side is 200 pounds and on the outlet side 15 pounds, it is apparent that when the weight 17 is properly balanced to be supported by 15 pounds pressure on the piston 16 in the cylinder 15 valve 21 will be closed and valve 20 open allowing the 200 pound pressure to pass into the chamber 3 holding the valve disk 10 tightly in closed position. When the pressure in the outlet pipe 7, to which the sprinkler heads are attached, falls below 15 pounds by the opening of a sprinkler head, the weight 17 will fall, opening valve 21 and closing valve 20. The pressure on the

top of piston 8 is relieved, through the outlet 22, no more can be applied by reason of the closing of valve 20 and the pressure on the under side of the piston 8 will cause it to rise lifting the valve disk 10 and permitting the full 200 pounds to enter pipe 7 and pass to the sprinkler heads.

In order that the lower pressure in pipe 7 may at all times be maintained so there can be no premature lifting of the valve disk 10 a by-pass 27 with a reducing valve 28 leads from the inlet pipe 6 to the outlet pipe 7 the valve 28 being set for any desired pressure in the outlet pipe. In case the outlet pipe 7 is kept dry to avoid freezing, the by-pass 27 and valve 28 are omitted and air pressure to balance the weight 17 is introduced into the pipe 7 in any desired manner.

In some cases a diaphragm in a casing, as shown in Fig. 6, is employed in lieu of the piston and cylinder of Figs. 2, 3, 4, and 5 without changing the principle or method of operation.

To seat the valve disk 10 to close the valve, it is only necessary to raise the weight 17 thus allowing the pressure to enter the top of the cylinder 2 and push down on the stem 9.

I claim:—

1. A valve comprising a casing consisting of an inlet chamber, an outlet chamber and a cylinder above the inlet chamber, a valve adapted to close the opening between the inlet and outlet chambers, a valve stem thereon, a piston on the stem within the cylinder, a fluid passage between the inlet chamber and the cylinder space above the piston, means for venting the cylinder space above the piston and means for closing the fluid passage while the cylinder is venting.

2. A valve comprising a casing provided with an outlet chamber, an inlet chamber and a cylinder above the inlet chamber, a valve adapted to close the opening between the inlet and outlet chambers, a valve stem thereon, an imperforate piston in the cylinder on the valve stem, an open passage between the inlet chamber and the cylinder space above the piston, a vent valve in the passage and means for opening said vent valve controlled by the pressure in the outlet.

3. A valve comprising a casing provided with an outlet chamber, an inlet chamber and a cylinder above the inlet chamber, a valve adapted to close the opening between the inlet and outlet chambers, a valve stem thereon, an imperforate piston in the cylinder on the valve stem, an open passage between the inlet chamber and the space above the piston, a vent valve and a shut off valve in the passage and means for synchronously opening one and closing the other of said valves controlled by the pressure in the outlet.

4. A valve comprising a casing, a cylinder extending upwardly therefrom, a piston in said cylinder, a valve seat dividing the space below the piston into an upper and a lower chamber, a valve disk normally on said seat connected with the piston, an inlet leading into the upper chamber and an outlet leading from the lower chamber, a connection between the inlet and the space above the piston, means for relieving the pressure above the piston whereby the pressure below will cause it to rise and open the valve, a second connection between the inlet and outlet and a reducing valve therein whereby proportionate pressures may be maintained in the inlet and outlet.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOHN J. TAGUE.

Witnesses:
J. BERNHARD BOLLMAN,
ROBERT B. KILLGORE.